Form C-104
Rev. 02/2009

VALUE ENGINEERING CHANGE PROPOSAL
MISSOURI DEPARTMENT OF TRANSPORTATION

☒ Conceptual Proposal ☐ Final Proposal Date 7-22-09

Contract ID 090626-802 Job No. J8P0605B

County Greene Original Bid Cost 26,943,391.77

Contractor Emery Sapp & Sons By

Designed By MoDOT Phone 573-445-8331

VECP# 09-61 (to be completed by C.O.) VECP ☐ or PDVECP ☐

1. **Description of existing requirements and proposed change(s). Advantages/Disadvantages**
   The existing plans show the drainage structures on J8P0605B to be installed as deep as 8 vertical feet. We propose raising the structures and pipes to a shallower depth, while maintaining at least 1' of coverage and proper pipe slope. Since this involves many structures over relatively long distances the percentage of fall would not be greatly changed. This would save the depth of drop inlets required for construction as well as unnecessary excavation. Spreadsheets showing our calculations are attached. If redesign is required we will need to adjust the savings listed below.

2. **Estimate of reduction in construction costs.** $329,025.26

3. **Prediction of any effects the proposed change(s) will have on other department costs, such as maintenance and operations.**
   No effects to any other departments as we know of.

4. **Anticipated date for submittal of detailed change(s) of items required by Section 104.6 of the Specifications.**

   7-22-09
   (date)

5. **Deadline for issuing a change order to obtain maximum cost reduction, noting the effect of contract completion time or delivery schedule.**

   8-7-09 (date) — We plan to start on the drainage on this phase first if granted an early notice to proceed. (effect)

6. **Dates of any previous or concurrent submission of the same proposal.**

   (date and/or dates)

EMERY SAPP & SONS, INC.

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July 22, 2009

Mr. Gayle Davis R.E.
Missouri Dept. of Transportation
251 SW Outer Road
Branson, MO 65616

RE: **Value Engineering #1**
Rte.H, Greene County
Job No J8P0605B

Mr. Davis:

Attached is the value engineering proposal that I spoke to you about earlier this afternoon. This Value Engineering proposal includes raising a large portion of the drop inlets, pipe runs, and box culverts on job J8P0605B. Raising these items will eliminate a large quantity of Class 3 Excavation as well as unnecessary drop inlet depth. The attached spreadsheet shows all of the existing and revised elevations for the storm sewer on the above referenced project. While bidding this project we noticed that the average depth of the storm sewer on job J8P0605B was much deeper than the storm sewer on the other two projects that we will be building. Please review our calculations and let us know as soon as possible if there is any reason that these drainage structures need to be placed deeper than the storm sewer that was designed on projects J8P0605D & J8P0605E. A breakdown of the total savings is included on the spreadsheet tab named, "Drop Inlets". We did not include any additional costs for redesign since we only adjusted the slope of the pipe runs slightly. If any redesign is required it will reduce our total savings.

We plan on asking for an early notice to proceed with intentions of starting on the storm sewer for project J8P0605B. I have listed August 7th as a proposed acceptance date for the attached value engineering. If we have an answer by then this will help expedite our survey crew as well as our suppliers. If you have any questions or need any additional information please don't hesitate to call.

Sincerely,

Emery Sapp & Sons, Inc.

Josh Doerhoff

Additional Comments:

**** Portion Below This Line To Be Filled Out by MoDOT ****

Comments: While we appreciate the perception of and submittal of this VE proposal, which would provide considerable potential savings, after review by the Project Office and District 8 Design Team, we find that the proposed changes, to elevations and slopes of the box culvert, pipe, and drop inlet network, would negatively impact the design intent for storm water retention and metered discharge. We, therefore, do not recommend approval of this plan. Please see attached specific comments from Design Team.

Submitted By Resident Engineer — Date: 7/31/09

Comments: I concur with the assessment made by the R.E. and review by designer.

☐ Approval Recommended
☑ Rejection Recommended

Matthew C. Seeley — District Engineer — Date: 8/4/09

Comments:

☐ Approval Recommended
☐ Rejection Recommended

N.A. — Federal Highway Administration — Date
Required for FHWA Full Oversight Projects

Comments: PROPOSAL UNACCEPTABLE IN ITS PRESENT FORM BECAUSE OF ENGINEERING ISSUES. PROPOSAL MAY BE RECONSIDERED IF DISTRICT CONCERNS ARE ADDRESSED ~~ADEQUATELY~~ ADEQUATELY.

☐ Approval
☒ Rejection

David D. Gordon by BB — State Construction and Materials Engineer — Date: 8-10-09

Distribution: Resident Engineer, Project Manager, District Construction & Materials Engineer, State Construction & Materials Engineer, FHWA Value Engineering Administrator – MoDOT, P. O. Box 270, Jefferson City, MO 65102

After reviewing the Value Engineering Proposal for the J8P0605B Project, four concerns can be readily noticed.

1 The supplier has designed the product assuming a negligible velocity at the downstream end wall of the box culvert. Increasing the slope of the box culverts will increase the velocity of the storm water.

2 Increasing the slope of the box culvert will reduce the usable volume by allowing contained water to rise out of the lowest drop inlet before the box is completely filled.

3 Increasing the slope on the 12'×3' box culverts will keep the flow regime from the culvert pipes in supercritical flow for a longer period and cause the associated hydraulic jump to occur farther downstream in the box culvert. This could allow the hydraulic jump to occur at a drop inlet that in turn can cause a waterspout up through the grates in the median of US 65.

4 Increasing the elevation of the outlet of the Box Culvert will increase the slope of the outlet pipe that connects to the existing crossroad structure. Increasing this slope would increase the velocity and the volume of the pipe causing the crossroad pipe to have to carry more water than was previously being released.

VALUE ENGINEERING CHECK SHEET

TYPE OF WORK

(Check one that applies)

- ☐ Bridge/Structure/Footings
- X Drainage Structures (RCP, RCB, CMP's, ect.)
- ☐ TCP/MOT
- ☐ Paving (PCCP, ect.)
- ☐ Grading/MSE Walls
- ☐ Signal/Lighting/ITS
- ☐ Misc. _____

SUMMARY OF PROPOSAL

(If needed, condense summary to a couple of lines)

_____Adjust elevation of various drainage structures to reduce quantities.

SCANNING OF DOCUMENT

If the proposal is large, please mark or make note, which pages need to be scanned into the database. If there are special instructions, make note of them here.

_____Scan entire document.